KAZANSKIY, V.Ye., inzh. (Moskva)

Measurement of electrical resistance with three devices.
Elektrichestvo no.1:81-82 Ja '62. (MIRA 14:12)
(Electric measurements)
(Electric resistance--Measurement)

KAZANSKIY, Vladimir Yevgen'yevich; SAVOST'YANOV, A.I., nauchnyy red.; ~~CHISLOV, M.M., red.~~; BARANOVA, N.N., tekhn. red.

[Automation and remote control in electric power systems] Avtomatizatsiia i telemekhanizatsiia energeticheskikh sistem. Moskva, Proftekhizdat, 1962. 182 p. (MIRA 15:10)

(Automatic control) (Remote control)
(Electric power distribution)

KAZANSKIY, V.Ye., dotsent

Spedial features of measuring nonwymmetry current in the differential protection system of electric power transformers. Elek. sta. 34 no.3:94 Mr '63. (MIRA 16:3)
(Electric protection) (Electric transformers)

KAZANSKIY, Vladimir Yevgen'yevich; SAVOST'YANOV, A.I., nauchn. red.; CHISLOV, M.M., red.; BARANOVA, N.N., tekhn. red.

[Automatic and remote control in power systems] Avtomatizatsiia i telemekhanizatsiia energeticheskikh sistem. Moskva, Proftekhizdat, 1962. 182 p. (MIRA 16:7)
(Automatic control) (Remote control)
(Electric power distribution)

KAZANSKIY, V. Ye.

"Some Problems in Automation and Remote Control of Power Systems."

Dissertation for the degree of Doctor of Technical Sciences
defended at the Moscow Power Engineering Institute, January 1963.

Moscow, Elektrichestvo, No. 9, Sept, pp 94-95.

L 3108-66 EWT(d)/EWT(m)/EWP(i)/EWP(c)/EWP(v)/T/EWP(t)/EWP(k)/EWP(h)/EWP(b)/EWP(l)
ACCESSION NR: AP5026358 JD UR/0105/64/000/009/0094/0095

AUTHOR: * Tsvetkov, V. A.; Birzniyek, L. V.; Vysochanskiy, V. S.; Shakhnazaryan, Yu. M.; Kazanskiy, V. Ye.; Kapuntsov, Yu. D.; Salekh, M. A. Kh.; Frumkin, A. L.; Bakhovtsov, B. A.

TITLE: Dissertations in competition for the academic degree of doctor of technical sciences

SOURCE: Elektrichestvo, no. 9, 1964, 94-95

TOPIC TAGS: electric engineering, electric power engineering, electric equipment, electric distribution equipment, electric rotating equipment, automatic control, automatic control system

Abstract: The following defended dissertations at the Moscow Power Engineering Institute: V. A. TSVETKOV, 14 December 1962, on the theme "Autoparamagnetic Phenomena and Surges in Three-Phase Circuits which Contain Ferromagnetic Equipment," his official opponents -- Doctor of Technical Sciences, Professor V. A. TAFT and Candidate of Technical Sciences, Lecturer L. F. DMOKHOVSKAYA; L. V. BIRZNIYEK, 4 January 1963, on the theme "Electromagnetic Processes in Multistage Voltage Regulation Circuits in Electric

Card 1/4 *[NOT AUTHORS OF ARTICLE]

L 3108-66

ACCESSION NR: AP5026358

9

Rolling Stock with Semiconductor Rectifiers," his official opponents -- Doctor of Technical Sciences B. N. TIKHMENEV and Candidate of Technical Sciences, Lecturer L. M. TRAKHTMAN; V. S. VYSOCHANSKIY, 18 January 1963 on the theme "Methods for Controlling the Strip Tension at the Reel of a Cold Rolling Mills," his official opponents -- Doctors of Technical Sciences N. P. KUNITSKIY and N. N. DRUZHININ; Yu. M. SHAKHNAZARYAN, 18 January 1963, on the theme "Approximate Methods for Analysis of Non-Stationary Asynchronous Conditions in Electrical Systems," his official opponents -- Doctor of Technical Sciences, Professor L. G. MAMIKONYANTS and Candidate of Technical Sciences, Lecturer N. I. SOKOLOV; V. Ye. KAZANSKIY, 18 January, on the theme "Some Problems in Automation and Remote Control of Power Systems," his official opponents -- Doctor of Technical Sciences, Professor I. A. SYROMYATNIKOV and Candidate of Technical Sciences V. K. SPIRIDONOV; Yu. D. KAPUNTSOV, 18 January 1963, on the theme "An Asynchronous Electric Drive with Non-Symmetric Connection of the Saturation Chokes in the Stator Circuit," his official opponents -- Doctor of Technical Sciences V. Ye. BOGOLYUBOV and Candidate of Technical Sciences, Lecturer D. N. LIPATOV; M. A. Kh. SALEKH, 22 February 1963, on the theme "Theoretical Study of the Operation of Minature Two-Phase Asynchronous Machines when the Supply Voltage is not Sinusoidal," his official opponents -- Doctor of Technical Sciences, Professor A. I. BERTINOV and Candidate of Technical Sciences,

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L 3108-66 10

ACCESSION NR: AP5026358

Lecturer P. Yu. KAASIK; A. L. FRUMKIN, 8 March 1963, on the theme "A Theoretical and Experimental Study of the Permeability of Anisotropic Thin Magnetic Films," his official opponents -- Doctor of Physical and Mathematical Sciences, Professor R. V. TELESNIN and Candidate of Technical Sciences, Lecturer P. P. MESYATSEV; B. A. BAKHOVTSOV, 19 April 1963, on the theme "Synthesis of Systems for Automatic Control of Starting and Stopping of Electric Drives," his official opponents -- Doctor of Technical Sciences, Professor A. S. SANDLER and Candidate of Technical Sciences, Lecturer Yu. Ye. NITUSOV. At the Moscow Higher Technical Academy imeni Bauman -- G. A. MIRONOV, 10 December 1962, on the theme "A Method for Experimental Programming of Electronic Digital Computers," his official opponents -- Doctor of Physical and Mathematical Sciences, Professor L. A. LYUSTERNIK and Candidate of Technical Sciences, V. Ya. PETROV. At the All-Union Electrotechnical Institute im. Lenin -- V. A. VOL'KENAU, 11 December 1962, on the theme "Conductivity of Carborundum," his official opponents -- Doctor of Technical Sciences, Professor V. V. BURGSDORF and Candidate of Technical Sciences, D. V. SHISHMAN. At the Academy of Municipal Economy im. Pamfilov -- V. A. KOZLOV, 14 January 1963, on the theme "Problems in the Use of Closed Systems for Municipal Electrical Networks," his official opponents -- Professor P. G. GRUDINSKIY and Candidate of Technical Sciences, Lecturer F. F. VORONTSOV.

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L 3108-66

ACCESSION NR: AP5026358

At the All-Union Scientific Research Institute of Electromechanics -- L. Ya. STANISLAVSKIY, 23 November 1962, on the theme "On Work in the Field of High Power Turbogenerators and Hydrogenerators," his official opponents -- Doctor of Technical Sciences, Professor I. M. POSTNIKOV, Doctor of Technical Sciences I. D. URUSOV and Candidate of Technical Sciences Yu. M. EL'KIND.

Research Institute of Railroad Transportation: V. D. TULUPOV, 21 December 1962, on the theme "Development and Investigation of a System for Automatic Control of Rheostat Braking of Rectifier Electric Locomotives," his official opponents -- Doctor of Technical Sciences B. N. TIKHMENEV and Candidate of Technical Sciences B. G. KAMENETSKIY; V. D. MONTSEV, 21 December 1962, on the theme "Protection of Traction Motors from Short Circuit Currents During Regenerative Braking," his official opponents -- Doctor of Technical Sciences, Professor V. Ye. ROZENFEL'D and Candidate of Technical Sciences L. M. TRAKHTMAN; A. V. KAMENEV, 11 January 1963, on the theme "Study of Voltage Control Systems for Power Transformers in AC Electric Locomotives with Rectifiers," his official opponents -- Doctor of Technical Sciences, I. P. ISAYEV and Engineer Kh. Ya. BYSTRITSKIY.

ASSOCIATION: none

SUBMITTED: 00 ENCL: 00 SUB CODE: EE, IE

NO REF SOV: 000 OTHER: 000 JPRS

Card 4/4

KAZANSKIY, Yu. A.

USSR/Nuclear Physics - Penetration of Charged and Neutral Particles Through Matter, C-6

Abst Journal: Referat Zhur - Fizika, No 12, 1956, 34108

Author: Tsypin, S. G., Kukhtevich, V. I., Kazanskiy, Yu. A.

Institution: None

Title: Penetration of Gamma Rays Through Water, Iron, Lead, and a Combination of Iron and Lead

Original Periodical: Atom. Energiya, 1956, No 2, 71-74

Abstract: The attenuation of the dosage of gamma rays in Fe, water, and Pb is measured for an "infinite" geometry. In the "barrier" geometry, the dosage attenuation of gamma rays was measured for mixtures of iron and lead. The experimental data obtained are compared with the results of calculations based on the Fano theory.

1 of 1

KAZANSKIY, YU. A.

KAZANSKIY, Yu. A.

120-2-7/37

AUTHOR: Burmistrov, V. R. and Kazanskiy, Yu. A.

TITLE: Compton Spectrometer Using Superposition of Pulses. (Komptonovskiy Spektrometr So Slozheniyem Impul'sov.)

PERIODICAL: Pribory i Tekhnika Eksperimenta, 1957, No.2, pp. 26 - 29 (USSR).

ABSTRACT: After a short discussion of the working of the Compton spectrometer using two scincillating crystals, the authors proceed to give the description of a method which permits a substantial increase of the efficiency of the spectrometer without deterioration in its resolving characteristics. Three crystals are used: one central and two side crystals. The increase of the efficiency is obtained by increasing the solid angle of resolution $\Delta\theta$ by virtue of combining pulses from the central and from the side crystals. The principle of the new method is as follows: when the Compton scattering of the incident γ-quantum $h\nu_o$ occurs at the centre crystal, a pulse V_1 is obtained at the output of the photomultiplier, the amplitude of which is proportional to the energy of the emitted electron ($V_1 = a(H\nu_o - h\nu^1)$. If the scattered γ-quantum $h\nu^1$, hitting the controlling crystal, is totally absorbed, the amplitude of pulse V_2 at the photomultiplier will be

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proportional to the energy of the scattered quantum: $V_2 = bh\nu^1$. But "a" could be made equal to "b". Combining V_1 and V_2 one obtains V_3 equal to $V_1 + V_2 = ah\nu_o$ i.e. a pulse proportional to the incident radiation energy and independent of the angle θ (angle of scattering), provided that the dispersed quantum is totally absorbed in the controlling crystal. With a monochromatic incident radiation this method would produce one single peak corresponding to the energy $h\nu_o$ plus some energy spread due to the incomplete absorption of the scattered quanta in the controlling crystal. The problem of the spectrometer resolution (full width at half height) is considered next. Equation 2 is derived giving the resolution of the combined peak η_3 as function of ΔV_1, and ΔV_2. For a single crystal spectrometer the dependence of resolution η on the amplitude V of the pulse is given by equation 3. Evaluating ΔV_1, and ΔV_2 from equation 3 and substituting into equation 2, equation 4 is obtained, where C is a constant depending on the photomultiplier and on the light output of the crystal η_o. It may be seen from equations 3 and 4 that

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SOV/89-5-4-10/24

AUTHORS: Kazanskiy, Yu. A., Belov, S. P., Matusevich, Ye. S.

TITLE: Angular- and Energy Distribution of γ-Rays Scattered by Iron and Lead (Uglovyye i energeticheskiye raspredeleniya γ-izlucheniya, rasseyannogo v zheleze i svintse)

PERIODICAL: Atomnaya energiya, 1958, Vol 5, Nr 4, pp 457-459 (USSR)

ABSTRACT: Measurements were carried out on the angular- and energy distribution of Co^{60} and Au^{198} γ-radiation which had been scattered by lead with $\mu_0 r$ = 2,2; 4,1; 6,3; 8,2 and iron with $\mu_0 r$ - 2, 4, 6, 8,5, and 9,8 (μ_0 denotes the absorption coefficient of γ-radiation and r - thickness of the filter). Measurement took place in semi-infinite geometry.
For measurements the scintillation spectrometer (CsJ(Tl)-crystal: diameter 30 mm, height 27 mm) was used.
Measurements were carried out at the following angles θ: 10, 20, 30, 40, 50, and 60°.
The angular distributions obtained are plotted in graphs. The results obtained by the present paper and the papers of ref-

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erences 1 - 3 permit the following conclusions to be drawn: The angular distribution of the intensity of the scattered γ-rays depends only little upon the thickness of the layer of the scattered medium (up to a thickness of layer of 10 free lengths of path). This determination holds for materials with small as well as with medium or large Z (concrete, iron, lead) within the γ-energy domain of from 0,4 to 1,3 MeV. S. G. Tsypin and V. I. Kukhtevich advised the authors in working out this paper, and S. I. Chubarov and V. I. Popov assisted in carrying out experiments. There are 6 figures and 4 references, 1 of which is Soviet.

SUBMITTED: April 13, 1958

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721320010-5"

KAZANSKIY, YU. A.

AUTHORS: Kukhtevich, V. I., Kazanskiy, Iu. A., Nikolayshvili, Sh. S., Tsypin, S. G.

89-2-4/35

TITLE: The Passage of Scattered γ-Rays Through Water (Prokhozhdeniye rasseyannogo γ-izlucheniya v vode).

PERIODICAL: Atomnaya Energiya, 1958, V. 4, Nr 2, pp. 138-143 (USSR).

ABSTRACT: Sources of γ-rays (Au^{198}, Co^{60}, Na^{24}) are mounted in a large water tank on a mobile support in such a way, that an immediate irradiation of the detector is excluded, and that, on the other hand, different collimation angles may be adjusted. The dependence of the weakening of the γ-quanta scattered in the water on the distance between the source and the detector is measured and also computed. The distance from the source to the detector amounted to 3 - 4 and 8 - 12 lengths of the mean free path of γ - quanta in water. The collimation angle were varied between 30 and 80°. Three curves show the percentual decrease of the dose dependent on the distance x.

1. Au^{198} x=70 to 140 cm α=79°, 52,5°, 32°

2. Co^{60} x=60 to 140 cm α=82°, 59°, 47°

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The Passage of Scattered γ-Rays Through Water. 89-2-4/35

3. Na^{24} x=70 to 140 cm α=80°, 62°, 46°.

The figures also include the computed curves, the functions $\mu(E)$, $\mu_a(E)$ and $B(E, \mu_x)$ being taken from reference 5. A sufficient accord can be found between experimental and theoretical curves. There are 5 figures, and 6 references, 2 of which are Slavic.

SUBMITTED: March 16, 1957.

AVAILABLE: Library of Congress.

Card 2/2 1. Gamma rays-Energy-Measurement 2. Gamma rays-Scattering

AUTHORS: Kazanskiy, Yu.A., Belov, S.P.

89 -1-10/18

TITLE: The Spectrum of Scattered γ-Radiation After Passage Through a Lead Barrier (Spektr rasseyannogo γ-izlucheniya posle prokhozhdeniya svintsovogo bar'yera).

PERIODICAL: Physics and Thermotechniques of Reactors (Fizika i teplotekhnika reaktorov), Supplement Nr 1 to Atomnaya energiya, 1958, (USSR) p 123-127

ABSTRACT: The spectral and angular distribution of the γ-radiation of a ~ 0.5 C Co-60-source is dealt with after the γ-radiation has passed through a lead block of $\mu_0 r = 3.9$ (given in free lengths of path). Measuring was carried out with a swivelingly mounted scintillation spectrometer. Spectral distribution was measured at 0, 10, 20, 30, 48 and 60°; the respective curves are given. Furthermore, the differential energy spectrum of the scattered γ-intensity is given. Within the range of from ~ 0.5 to 1.2 MeV experimentally and theoretically computed values agree well, whereas from 0.3 to 0.5 MeV they do not. There are 3 figures, 1 table, and 4 references, 1 of which is Slavic.

AVAILABLE: Library of Congress

Card 1/1

1. Gamma rays-Scattering 2. Gamma rays-Spectrum

CYPIN, S.G. [Tsypin, S.G.]; KUCHTEVIC, V.I. [Kukhtevich, V.I.]; KAZANSKIJ, J.A. [Kazanskiy, Yu.A.]; KAPLAN, J. [translator]

Penetration of gamma rays through water, iron, lead and combined layers of iron and lead. Jaderna energie 4 no.7:191-193 Jl '58.

KAZANSKIY, Yu. A. Cand Phys-Math Sci -- (diss) "Angular energy distributions of gamma-radiation scattered in a medium." /Mos/, 1959. 16 pp 100 copies. Bibliography at end of text (18 titles) (KL, 43-59, 120)

21(7) SOV/89-6-6-11/27

AUTHORS: Belov, S. P., Dulin, V. A., Kazanskiy, Yu. A., Kukhtevich, V. I., Tsypin, S. G.

TITLE: Space and Energy Distribution of the Neutrons in Boron Carbide (Prostranstvennoye i energeticheskoye raspredeleniye neytronov v karbide bora)

PERIODICAL: Atomnaya energiya, 1959, Vol 6, Nr 6, pp 663 - 665 (USSR)

ABSTRACT: The authors report on investigations of space and energy distributions of 3 and 15 Mev neutrons in boron carbide. The 3 Mev neutrons were the product of the reaction $H^2(H^2,n)He^3$, the 15 Mev neutrons from $H^2(H^3,n)He^4$. The test arrangement (infinite geometry) is briefly described. Boron carbide $\gamma = 1.18 \pm 0.05$ g/cm^3; neutron detectors: 1) proportional counter with BF_3 enriched to 88% with B^{10}; 2) fission chamber with natural uranium, U^{235} (enriched to 75%), and Th^{232}; 3) threshold indicators: $P^{31}(n,p)Si^{31}$, $Al^{27}(n,p)Mg^{27}$, $Fe^{56}(n,p)Mn^{56}$, $Sb^{121}(n,2n)Sb^{120}$, $Cu^{63}(n,2n)Cu^{62}$, $In^{115}(n,\gamma)$ In^{116m}. Figure 1 shows the space neutron distribution (3 and 15 Mev) in the passage through

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boron carbide. Detectors for the 3 Mev neutrons: 1) and 2), for the 15 Mev neutrons, 2) and 3). It was found among others that an increase of the threshold energy of the detector increases the inclination of the attenuation curves of the neutrons. In measuring the 15 Mev neutron attenuation by means of the indicator $Cu^{63}(n,2n)Cu^{62}$ (E_{thresh}= 10.9 Mev) the relaxation path for the distance source - detector R > 16 cm does not change and is close to the transport path λ_{tr} = 18 ± 2 cm. A comparison of the data contained in the present paper with those from reference 1 (Geneva Paper Nr 2147, 1958) is briefly discussed. The following relative capture figures are determined:

indicator:	Cu^{63}	Sb^{121}	Fe^{56}	Al^{27}	P^{31}	In^{115}
measurement by counter	6.5±1	8±2	1	0.73±0.15	1.04±0.15	-
by spectrometer	-	-	1	0.65±0.15	-	6±2

Space and Energy Distribution of the Neutrons in Boron Carbide SOV/89-6-6-11/27

Figure 2 shows the energy distribution of the neutron flux in boron carbide for different intervals (energy interval 1.5 - 15 Mev, results standardized in the interval 13.5-15 Mev). Moreover, the ratio between $\sigma_{U\,235}(E_{eff})$ and $\sigma_{B\,10}(E_{eff})$ of the reaction (n,α) with B^{10} in boron carbide was determined. In the case of 3 Mev neutrons 0.97 ± 0.03 was obtained at $E_{eff} = 120 \pm 10$ kev. In conclusion, the authors thank I. I. Bondarenko for advice and discussions, N. D. Proskurnina, V. F. Bashmakov, A. N. Nikolayev, and V. I. Popov for assistance in the experiments as well as A. N. Serbinov and I. A. Vorontsov for work at the neutron generator. There are 2 figures, 1 table, and 4 references, 2 of which are Soviet.

SUBMITTED: January 6, 1959

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SOV/120-59-4-4/50

AUTHOR: Kazanskiy, Yu. A.

TITLE: Conversion of Amplitude Distributions into Energy Spectra.

PERIODICAL: Pribory i tekhnika eksperimenta, 1959, Nr 4, pp 32-36 and 1 table (USSR)

ABSTRACT: Sodium iodide and caesium iodide crystals are widely used in the study of discrete and continuous γ-ray spectra. One of the difficulties in γ-spectroscopy is that the relation between the energy of the γ-radiation and the amplitudes of pulses at the output of the photomultiplier is not unique. Thus, the instrument spectrum, i.e. the pulse height spectrum obtained at the output of the photomultiplier for γ-rays with energies less than 1.5 Mev consists of a well-defined photo peak and a Compton distribution due to the Compton scattering in the crystal. In the analysis of complicated or continuous γ-ray spectra, it is often necessary to convert the instrument pulse height spectrum to the required energy spectrum of the incident γ-rays. In the most general case, the problem reduces to the solution for $N(E)$ of the integral equation given by Eq (1), where $N(v)$ is the measured pulse height distribution, $N(E)$ is the required energy spectrum of the γ-rays and $K(E, v)$ is the probability that a γ-quantum having an energy E gives rise to a pulse with an

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Conversion of Amplitude Distributions into Energy Spectra

amplitude v . In a number of papers (Refs 1 and 2) Eq (1) was replaced by a system of interdependent linear equations from which N(E) could be found. The function K(E, v) is given in the form of a numerical matrix which is found experimentally (Ref 2), by approximate numerical calculations (Ref 3), or is obtained from Monte Carlo calculations of the function K(E, v) . The experimental determination of the function K(E, v) in the energy region below 2.5 Mev is superior to the theoretical calculation, particularly when the experiment involves good collimation. The present paper is concerned with the experimental investigation of the form of the instrument spectrum and the efficiency of a single crystal (CsI(Tl)) scintillation γ-spectrometer. The form of the instrument spectrum for a mono-energetic γ-radiation was investigated, using the apparatus shown diagrammatically in Fig 1. The caesium iodide crystal used had a diameter of 30 mm and a length of 27 mm. It was placed in contact with an FEU-29 photomultiplier inside a lead screen. The γ-radiation was collimated by a collimator having a hole 10 mm in

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diameter and 270 mm long. Pulses from the photomultiplier were fed through a cathode follower into a linear amplifier, followed by a 20-channel pulse height analyzer. The γ-ray sources were held in a lead holder at a distance of not less than 30-40 mm from the face of the collimator. In order to exclude γ-rays scattered from the source holder and to reduce the contribution from γ-radiation scattered in the source itself, a 2-layer filter (cadmium and lead) was placed in front of the collimator. The cadmium plate was 1.5 mm thick and absorbed the 80 Kev fluorescence radiation from the lead filter. Fig 3 shows the instrument Compton distributions $L(E_0, E)$ derived from the pulse height distributions measured for the various sources indicated, obtained by subtracting the photopeak and the scattered γ-radiation leaving the source. Using Fig 3 the instrument Compton distributions for various initial energies E_0 have been calculated at intervals of 40 Kev. Table 1 gives a numerical matrix for $L(E_0,E)$ obtained in this way. The horizontal rows of the matrix give the instrument Compton distribution for a given E_0. The matrix is normalized so that each number represents the number of pulses recorded at the energy E in an interval

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Conversion of Amplitude Distributions into Energy Spectra

ΔE = 1 Kev for 10^5 pulses in the photopeak. The photopeak efficiency, i.e. the ratio of the number of pulses in the photopeak to the number of γ-quanta incident on the crystal, has also been determined both experimentally and by calculation, using formula (2), in which $\varepsilon_{\text{Ф}}$ is the efficiency, d is the thickness of the crystal container, μ_1 is the absorption coefficient of the material of the container, Ω_0 is the geometrical solid angle of the collimator, $\Omega_{\text{эф}}$ is the effective solid angle of the collimator and h is the thickness of the crystal. The dotted curve in Fig 4 gives $\varepsilon_{\text{Ф}}$ as a function of energy. Using these data, it is possible to convert the instrument spectrum into the true energy spectrum of the incident γ-rays, Acknowledgments are made to

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SOV/120-59-4-4/50

Conversion of Amplitude Distributions into Energy Spectra

I. I. Bondarenko, S. G. Tsypin and V. I. Kukhtevich for valuable discussion, and to S. P. Belov and Ye. S. Matusevich for help in the present work. There are 6 figures, 2 tables and 11 references, of which 2 are Soviet, 1 is Swiss, 1 Swedish and the rest English.

SUBMITTED: May 13, 1958.

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S/089/60/008/05/02/008
B006/B056

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AUTHOR: Kazanskiy, Yu. A.

TITLE: Angular Energy Distributions of γ-Radiation Scattered in Water and Iron 79

PERIODICAL: Atomnaya energiya, 1960, Vol. 8, No. 5, pp. 432 - 440

TEXT: The present paper deals with measurements of the angular energy distributions $N(\vec{r},\vec{\Omega}, E)$ of γ-radiation (Co^{60}-source) that was several times scattered in water or iron in semi-infinite geometry. The distribution of γ-radiation scattered in water was measured by means of a device which is schematically shown in Fig. 1, while that scattered in iron was measured by means of an apparatus described in Ref. 6. The gamma distribution was in the first case measured at $5\mu_0 r$-values (0.5, 1.0, 1.8, 3.5, 4.5) at different Θ (Θ - angle of rotation of the spectrometer, cf. Fig. 1), and in the second case for different Θ only at $\mu_0 r = 5.9$. For measuring γ-radiation scattered in water, sources of

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Angular Energy Distributions of γ-Radiation Scattered in Water and Iron

S/089/60/008/05/02/008
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different intensities (1370, 600, 194 mC) were used. The results obtained by these measurements are shown in numerous diagrams. Fig. 3 shows the distribution curves for the source-distances $\mu_0 r = 0.5$ and 4.5 for various Θ. In Fig. 4 angular distributions of the intensities of individual lines are compared with the theoretical results of Ref. 2. In the case of lines 265 and 365 kev the deviations are less than 40%, and at 750 kev - 20%. Fig. 5 shows $I_0 = 2\pi \sin\Theta \, d\Theta \int N(r, \Theta, E)EdE$. The angular distribution curve of intensity takes an exponential course between $5 - 10^{\circ}$ and 90° with an accuracy of 7 - 10%. Fig. 6 shows the energy spectrum of the intensity $I_0 = 2\pi \int \sin\Theta N(r, \Theta, E)EdE$. I_0 was determined by graphical integration of the distribution $N(r, \Theta, E)$. For comparison, the diagram shows also the curve calculated in Ref. 1. Fig. 7 shows the angular energy distribution of γ-radiation scattered in iron. A comparison between the γ-radiation fraction scattered in water and iron and data for concrete (Ref. 4) shows that within the range of low energies (100 - 400 kev) the fraction of γ-radiation scattered by

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concrete is greater. The energy spectrum of intensity I_o for iron, which was also obtained by graphical integration, is shown by Fig. 8, the angular distribution of the intensities I_θ by Fig. 9. All angular energy distributions of scattered γ radiation have a more or less distinct maximum near energies that correspond to single scattering through the angle θ. Fig. 10 shows the energy distribution for iron and lead at θ = 10 and 40^o. The angular distribution of intensity may be represented analytically (within the limits of measuring accuracy) by the function $I_\theta = ke^{-\theta/\theta_o}$, where θ_o and k are coefficients; k is determined by equation (5), θ_o is given for lead, iron, and water in the Table on p. 439. The authors finally thank I. I. Bondarenko, V. I. Kukhtevich, and S. G. Tsypin for discussions, as well as A. N. Voloshin and V. I. Popov for their assistance in the experiments. There are 10 figures, 1 table, and 12 references: 4 Soviet, 6 American, and 2 Canadian.

SUBMITTED: May 28, 1959.

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B006/B070

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AUTHORS: Dulin, V. A., Kazanskiy, Yu. A., Mashkovich, V. P., Panov, Ye. A., Tsypin, S. G.

TITLE: Investigation of the Attenuation Functions for Water Exposed to Isotropic and Highly Collimated Sources of Fission Neutrons 19

PERIODICAL: Atomnaya energiya, 1960, Vol. 9, No. 4, pp. 315 - 317

TEXT: In this "Letter to the Editor", the authors report on an experimental investigation of the space distribution of fission neutrons in water, the source of neutrons being a БР-5 (BR-5) reactor. The neutrons came out of a hole in a concrete shield (diameter 250 mm) and fell on a tank (137·139·217 cm) filled with doubly distilled water. The neutron beam had a total angular divergence of $\sim 5^{\circ}$. The neutrons were detected by proportional boron counters. Measurements could be made at each point of the tank, and the position of the point could be determined with an accuracy of 1 mm. Fig. 1 shows the geometry. Figs. 2 and 3 show the measured neutron distributions for different values of r (distance from

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the source) and different values of h (distance from the beam). Fig. 4 shows the attenuation function of neutrons of an isotropic point source multiplied by r^2 (curve a), and the attenuation function of a highly collimated plane source (b). The maximum error of the curve a occurs for small r (r = 40 cm, ~20%), and the minimum error (~5%) occurs for large r. The error of the curve b is between ~5% for r = 40 cm and ~20% for r = 140 cm. The two curves diverge from each other by about 20%, but this is within the limits of the error of measurement. Therefore, for thicknesses of water shield larger than 40 cm, the two curves may be considered to be coincident. Fig. 5 shows, for comparison, the experimentally obtained (Ref. 2) attenuation functions for neutrons of an isotropic disk source (diameter 71.2 cm). The attenuation functions according to which the curves are drawn read:

$G_{point}(r) = C_1 \int_0^{\pi/2} N(r,\theta)\sin\theta d\theta$; $G_{plane}(r) = C_2 \int_0^{\infty} N(r,h)h\, dh$; and

84233

Investigation of the Attenuation Functions for Water Exposed to Isotropic and Highly Collimated Sources of Fission Neutrons

S/089/60/009/004/013/020
B006/B070

$D_{disk}(r,a) = 2\pi \int_{r}^{\sqrt{r^2+a^2}} G_{point}(R)R\,dR$. a is the radius of the disk; $N(r,\theta)$ and $N(r,h)$ are the distribution functions shown in Figs. 2 and 3; and the C_i are constants. The authors thank O. I. Leypunskiy and V. V. Orlov for discussions and comments. There are 5 figures and 4 references: 2 Soviet and 2 US.

SUBMITTED: April 27, 1960

Card 3/3

ORLOV, V.V., kand. fiz.-mat. nauk, red.; TSYPIN, S.G., kand. fiz.-mat. nauk, red.; KAZANSKIY, Yu.A. [translator]; KUKHTEVICH, V.I. [translator]; MATUSEVICH, Ye.S. [translator]; NIKOLAYSHVILI, Sh.S. [translator]; SINITSYN, B.I. [translator]; YUS, S.V. [translator]; VISKOVA, M.V., red.; RYBKINA, V.P., tekhn. red.

[Protection of transportation units having nuclear engines; translated articles] Zashchita transportnykh ustanovok s iadernym dvigatelem; sbornik perevodov. Moskva, Izd-vo inostr. lit-ry, 1961. 619 p. (MIRA 14:12)

(Radiation protection) (Nuclear reactors—Safety measures)

21394

S/120/61/000/002/004/042
E032/E114

26.2242

AUTHORS: Dulin, V.A., Kazanskiy, Yu.A., Kuznetsov, V.F., and Smirenkin, G.N.

TITLE: A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

PERIODICAL: Pribory i tekhnika eksperimenta, 1961, No.2, pp.35-41

TEXT: The transformation of the amplitude distribution due to recoil protons into the neutron energy spectrum in the case of a small crystal (negligible multiple neutron scattering) for which the light output depends linearly on the proton energy, can easily be carried out by differentiating the experimental spectrum. In fact, in the case of stilbene which was used by the present authors the relation is not linear and small crystals cannot be used if an adequate counting efficiency is to be obtained. The light output due to recoil protons and the form of the amplitude distribution due to monoenergetic neutrons was investigated using a Van de Graaf generator and the $T(p,n)He^3$, $D(d,n)He^3$ and $T(d,n)He^4$ reactions. Neutron energies in the following ranges could thus be obtained: 0.3-3.5, 4-7.5 and

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S/120/61/000/002/004/042
E032/E114

A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

17-22 Mev respectively. The amplitude distributions due to recoil protons for 4.3 and 16.8 Mev neutrons are shown in Fig.1. The recoil-proton energy distribution P(E) can be obtained from the amplitude distribution $\Phi(V)$ with the aid of the following relation:

$$\Phi(V)dV = P(E)dE,$$

$$P(E) = \Phi[V(E)] \frac{dV}{dE} = F(E) \frac{dV}{dE} \quad (1)$$

The functions V(E) and dV(E)/dE which are necessary to compute the neutron spectra are shown in Fig.2. The experimental values of V(E) are well represented by the Birks theory (Ref.1) according to which

$$V(E) = \int_0^E \frac{dV}{dE'} dE' = \text{const} \int_0^E \frac{dE'}{1 + kB \cdot dE'/dx} \quad (3)$$

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A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

If dE'/dx is expressed in Mev/cm of the range in air then kB turns out to be 20 cm/Mev. Fig.3 shows the recoil proton spectra for 1.0, 1.8 and 3.6 Mev neutrons. These curves were obtained with a cylindrical stilbene crystal (30 mm diameter, 15 mm long). The curves have a hump at the high energy end which is due to multiple neutron scattering. The latter effect is small for neutron energies greater than about 2 Mev. It can therefore be neglected at the higher energies. Fig.4 shows the energy dependence of the resolution of the single-crystal spectrometer. The resolution in the energy range 1-22 Mev can be described by the formula:

$$\Delta E_n/E_n = 20/\sqrt{E_n}\,\%$$

The efficiency of the spectrometer η can be described by:

$$\eta(E_n) = \frac{1 - \exp\left[-\Sigma(E_n)d\right]}{E_n}\Delta E \qquad (4)$$

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S/120/61/000/002/004/042
E032/E114

A single-crystal, fast neutron scintillation spectrometer with discrimination against gamma-rays

where ΔE is the differentiation step for the recoil proton distribution. The efficiency for the above stilbene crystal was found to be about 3% at 2 Mev and about 0.5% at 10 Mev (the differentiation step was taken to be equal to the energy resolution ΔE_n). The discrimination against gamma rays is based on the differences in the effective scintillation decay constant for neutrons and gamma rays. The present authors have used the scheme suggested by Birks and described in detail by F.D. Brooks in Nucl. Instrum. and Methods, 1959, 4, 151 (Ref.5). Fig.13 shows neutron spectra for a Po-Be source (curve 1 - present results, curves 2 and 3 due to B.G. Whitmore and W.B. Backer (Ref.7: Phys.Rev., 1950, 78, 799) and J.O. Elliot and W.I. McGarry and W.R. Faust (Phys.Rev., 1954, 93, 1348, Ref.8). It is stated that the overall efficiency for neutrons having an energy of 2 Mev has been increased to about 10%. The gamma ray efficiency is lower by a factor of 100. Acknowledgements are expressed to L.D. Gordeyev, Yu.I. Baranov, V.I. Bol'shov and
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S/120/61/000/002/004/042
E032/E114

A single-crystal, fast neutron....

Yu.V. Pankrat'yev for assistance in this work.
There are 14 figures and 9 references: 2 Soviet and 7 English.

SUBMITTED: June 26 1960

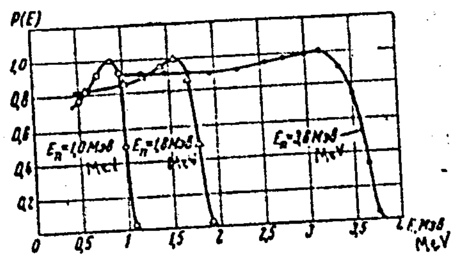

Fig. 3

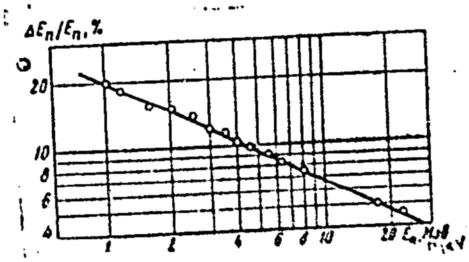

Fig. 4

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KAZANSKIY, YU. A.

AID Nr. 977-6 27 May

ENERGY DISTRIBUTION OF SCATTERED NEUTRONS IN WATER (USSR)

Dulin, V. A., Yu. A. Kazanskiy, and I. V. Shugar. Atomnaya energiya, v. 14, no. 4, Apr 1963, 404-405. S/089/63/014/004/011/019

The neutron spectra in water from an ~15 Mev neutron source have been measured at distances of 20 to 90 cm from the source, which was an $H^3(H^2, n)He^4$ reaction with deuteron energy of 400 Kev. A single-crystal fast-neutron scintillation spectrometer with γ-ray discrimination was used as a detector. The results obtained are presented in the form of histograms which can be used for determining the relaxation length for a group of neutrons with energy of 14 to 16 Mev. At distances of 30 to 60 and 60 to 90 cm, the relaxation length was found to be 15.0 ± 0.8 and 14.7 ± 0.9 cm, respectively, which is in good agreement with the results obtained previously with a $Cu^{63}(n, 2n)Cu^{62}$ indicator by B. I. Sinitsyn.

[AS]

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APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721320010-5

L 10288-63 EWT(m)/EPF(n)-2/BDS--AFFTC/ASD/AFWL/SSD--Pu-4

ACCESSION NR: AP3001181

S/0089/63/014/005/0488/0490

AUTHOR: Dulin, V. A.; Kazanskiy, Yu. A.; Shugar, I. V.

TITLE: Angular energy distribution of neutrons at the boundary of two media

63
60
19

SOURCE: Atomnaya energiya, v. 14, no. 5, 1963, 488-490

TOPIC TAGS: neutron scattering, neutron-energy distribution

ABSTRACT: Measurements were made of the spectra of scattered neutrons emerging at various angles at a boundary of water and a plane graphite layer. A fast neutron source with a mean energy of 3.9 Mev was placed at a 20-cm distance from the boundary. An H sup 2 (H sup 2, n)He sup 3 reaction with a deuteron energy of 900 Kev served as the neutron source. The neutron emission at the required angle was effected by means of a conical collimator with an angular resolution of about 5°. The neutrons were recorded with a single-crystal Gamma-discriminated scintillation spectrometer. The pulse amplitude distribution was recorded by means of an AI-100 analyzer. For each scattering angle the amplitude distribution was converted to the

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L 10288-63

ACCESSION NR: AP3001181

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neutron energy spectrum by means of a numerical matrix and by a differentiation method. The difference between the two results did not exceed 20% even in the energy range from 1.3 to 2.0 Mev. The neutron energy spectrum obtained at the graphite-water boundary is shown in the Fig. 1 of Enclosure. The results obtained by integration of angular energy distribution in the range from 0 to 180° are also plotted. The difference between the shape of measured and calculated spectra is due to the difference in geometry. "The authors are thankful to S. G. Tsypin for his valuable observations and to N. D. Proskurnina and V. G. Dvukhsherstnov for their help in the work." Orig. art. has: 4 figures and 1 table.

ASSOCIATION: none

SUBMITTED: 14Aug62 DATE ACQ: 21Jun63 ENCL: 01

SUB CODE: 00 NO REF SOV: 003 OTHER: 001

Card 2/2

S/056/63/044/001/001/067 45358
B108/B180

24,6500

AUTHORS: Bakov, A. T., Belov, S. P., Kazanskiy, Yu. A., Popov, V. I.

TITLE: Comparison of the gamma spectra from the radiative capture of thermal and fast neutrons

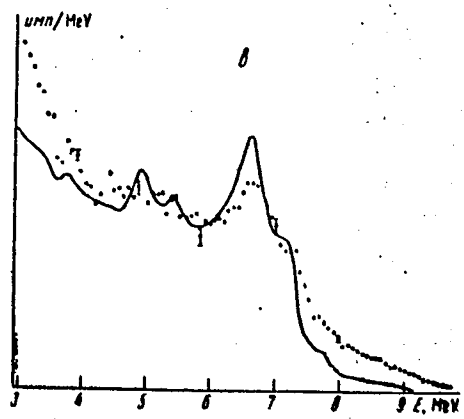
PERIODICAL: Zhurnal eksperimental'noy i teoreticheskoy fiziki, v. 44, no. 1, 1963, 3 - 9

TEXT: The gamma spectra arising from the capture of fast and thermal neutrons from a water-moderated uranium reactor in Mn, Co, Fe, Ni, and Cu were studied by means of a scintillation gamma spectrometer with an NaI(Tl) single crystal. To eliminate the gamma background, the sample was shielded on the reactor side by a Bi-Pb-Bi sandwich screen, and the detector by a screen of organic glass and boron carbide. The spectra of all five substances were similar in shape (Fig. 4). The difference in the gamma intensities produced by fast and thermal neutrons is attributed to the effect of P-neutrons. There are 4 figures.

SUBMITTED: May 9, 1962

Card 1/2

Fig. 4B. Gamma spectra of the radiative capture of thermal neutrons (solid line) and of neutrons of the entire reactor spectrum (dotted) for Fe. Legend: Ordinate - pulses per Mev.



ACCESSION NR: AT4019059 S/0000/63/000/000/0251/0260

AUTHOR: Dulin, V. A.; Kazanskiy, Yu. A.; Matusevich, Ye. S.

TITLE: Experimental methods for the study of shielding (radiation detector)

SOURCE: Voprosy* fiziki zashchity* reaktorov; sbornik statey (Problems in physics of reactor shielding; collection of articles). Moscow, Gosatomizdat, 1963, 251-260

TOPIC TAGS: nuclear reactor, reactor shielding, scintillation counter, radiation dosimetry, relative biological effectiveness, Monte Carlo method, radiation shielding, radiation detector, neutron spectrum, Gamma ray spectrum, neutron distribution, Gamma ray distribution, radiometry

ABSTRACT: The authors call attention to the need for the study not only of the total radiation dosage behind the shielding, in connection with the development of nuclear power, but also of its more detailed characteristics (e.g., the spatial and energy distribution of the neutrons and gamma-rays in the shielding, the angular and energy distribution of the neutrons and gamma-rays on the surface of the shielding, etc.). At the present time, practically all the modern means of radiation recording are used to investigate the spatial, energy and

ACCESSION NR: AT4019059

angular distributions of penetrating radiation in the shielding. The various requirements levied on sensors of ionizing radiation are reviewed. The point is made that in the problem of the passage of radiation within shielding, exhaustive information is contained in the angular energy distribution at each point in space with different geometries, the anisotropy functions and the energy levels of the radiation sources. It is noted that for the development of computation methods, comparatively incomplete information such as the spatial distribution of the dosage of gamma-rays and neutrons in the shielding, the behavior of neutron streams having energy levels above a certain threshold, the angular distribution of streams of gamma-rays and neutrons on the surface of the shielding, etc. is of extremely great value in that it permits the application, when studying shielding, of very simple but nonetheless effective methods involving the use of dosage and fission chambers, threshold indicators and the like. The measurement of integral characteristics is considered with special attention to the problems of gamma-ray and neutron dosage determination. The use of miniature ionization chambers is discussed and their characteristics are described. Dosimetric instruments, including scintillation counters, are analyzed in the light of their expectable performance in typical applications. A fundamental shortcoming of such devices

ACCESSION NR: AT4019059

is shown to be their inability to measure gamma-ray doses when neutrons are present. The method of pulse amplitude summing as a technique for enhancing the operational properties of the scintillation dosimeter is described. The fiber-equivalent polyethylene proportional detector (for neutron dosage measurements) is described and its operational principle analyzed. The concept of the "relative biological effectiveness" of neutrons as a function of their energy is discussed, and the difficulties encountered in its precise measurement are outlined. A section of the article is devoted to the measurement of neutron streams, in which it is pointed out that the technology of measuring the spatial distributions of such streams in the shielding does not differ essentially from the measurement of flow conditions encountered in the solution of other problems. The differences that do exist, in terms of sensitivity requirements and other instrumentation parameters, are noted. The authors note that gamma-ray spectral distribution studies are currently being pursued in two fundamental directions: (1) acquisition of data with respect to the spectra of the sources of gamma-radiation (for example, the reactor, the volumetric sources of gamma-rays, etc.); and (2) measurement of the angular and spectral distributions at the boundary of the medium, which also describe the radiation sources and, on the other hand, are absolutely indispensable for the computation of shadow shielding and the passage of

ACCESSION NR: AT4019059

gamma-rays in heterogeneous media; that is, in those problem areas which do not as yet lend themselves to analytical computations. Various methods used in this connection are discussed; among them, certain experimental techniques involving the determination of the form of the amplitude distribution of the pulses, the "random test method" (Monte Carlo method), and the use of spectrometers with NaI (Tl) crystals. The final section of the paper deals with the problem of neutron spectra measurements, and the techniques and instruments suitable for such investigations. "The authors express their deep gratitude to A. I. Abramov, V. I. Kukhtevich, V. P. Mashkovich, V. I. Popov, B. I. Sinitsy*n and S. G. Tsy*pin for their valuable contributions to this work".

ASSOCIATION: none

SUBMITTED: 14Aug63 DATE ACQ: 27Feb64 ENCL: 00

SUB CODE: NP NO REF SOV: 019 OTHER: 015

ABSTRACT: The authors measured the angular and energ[illegible]

[illegible]

lead [illegible] the boundary [illegible] water [illegible] after the passage [illegible]

1.5 to 4.6 of the mean free path. The neutron source was the reaction D(D,n)He3

Card

ACCESSION NR: AP4031132 S/0056/64/046/004/1163/1168

AUTHOR: Bakov, A. T.; Kazanskiy, Yu. A.

TITLE: Gamma rays from radiative capture of fast neutrons in manganese and copper

SOURCE: Zh. eksper. i teor. fiz., v. 46, no. 4, 1964, 1163-1168

TOPIC TAGS: Gamma rays, copper, manganese, radiative fast neutron capture, Gamma spectrometry, thermal neutron capture, p neutron, negative resonance

ABSTRACT: The measurements were made with neutrons from a Van de Graaff electrostatic accelerator (using the $T(p,n)He^3$ reaction) and a single-crystal scintillation γ spectrometer. The purpose of the experiment was to check the variation of the radiative-capture γ-ray spectrum with the variation of the partial cross sections corresponding to different orbital angular momenta. It is shown that, com-

APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721320010-5"

ACCESSION NR: AP4031132

pared with thermal neutrons, the probability of emission of ~8-MeV γ quanta during the capture of fast neutrons in copper decreases by a factor 4--5. This decrease can be attributed either to the influence of the change of the gamma ray spectrum with the ratio of the (n, γ) reaction in different copper isotopes, to the influence of p-neutrons whose cross section becomes appreciable at neutron energy ~50 keV, or else to a negative resonance with -100 eV energy causing the change in cross section of the radiative capture of thermal neutrons in Cu^{63}. The results for manganese show a spectrum that does not depend on the energy for fast neutrons and lies about 4--5 MeV lower for fast neutrons than for thermal ones. "In conclusion, the authors thank I. I. Bondarenko and A. V. Maly*shev for interest and a discussion, L. A. Timokhin and Yu. V. Kulabukhova for adjustment of the 256-channel analyzer, and the electrostatic generator crew." Orig. art. has: 5 figures and 1 table.

ASSOCIATION: None

Card 2/5

BELOV, S.P.; DULIN, V.A.; KAZANSKIY, Yu.A.; TSYPIN, S.G.

Angular distribution of 3 and 15 Mev. neutrons in beryllium. Atom. energ. 18 no.1:67-68 Ja '65. (MIRA 18:2)

Card 1 2

L 9944-65

ACCESSION NR: AP

SUBMITTED: 02Apr64 ENCL: [illegible] SUB CODE: [illegible]

NO REF SOV: [illegible] OTHER: [illegible] [illegible]

Card [illegible]

L 14697-66 EWT(m)/ETC/F/EPF(n)-2/EWG(m)/EWP(t)/EWP(b)/EWA(h) IJP(c) JD/WW/JG/DM

ACC NR: AP6008249 SOURCE CODE: UR/0089/65/019/005/0452/0453

AUTHOR: Belov, S. P.; Demin, V. P.; Kazanskiy, Yu. A.; Popov, V. I.; Lobakov, A. P.

ORG: none

TITLE: Secondary gamma-emission coefficients for aluminum, copper, and tungsten

SOURCE: Atomnaya energiya, v. 19, no. 5, 1965, 452-453

TOPIC TAGS: aluminum, tungsten, copper, gamma flux, neutron flux, gamma quantum, secondary emission, radiation shielding

ABSTRACT: The coefficient of secondary gamma emission-the ratio of total capture-gamma flux with energies above threshold emitted from a shielding surface to the total neutron flux leaving the same surface-was determined for Al, Cu, and W, using the RIZ reactor as the neutron source. Measurements were made for gamma quanta over 5 Mev and for shielding thicknesses of 20 cm for Al, 9.5 to 48 cm for Cu, and 5 to 17 cm for W. [NA]

SUB CODE: 18, 20 / SUBM DATE: 10Mar65 / ORIG REF: 004

BVK

Card 1/1 UDC: 539.122

L 22419-66 EWT(m)/EWA(h)

ACC NR: AP6007950 SOURCE CODE: UR/0089/66/020/002/0143/0143

AUTHORS: Kazanskiy, Yu. A.; Trykov, L. A.; Dulin, V. A.; Zolotukhin, V. G.; Tarasko, M. Z.

ORG: none

TITLE: Transformation of integral amplitude distributions into neutron energy spectra 19,44,55

SOURCE: Atomnaya energiya, v. 20, no. 2, 1966, 143

TOPIC TAGS: neutron spectrum, neutron detector, scintillation detector, pulse height analyzer, nuclear reactor shield, iron, beryllium

ABSTRACT: This is an abstract of article No. 52/3404 submitted to the sourc editor but not published in full. The authors improve the accuracy with which the neutron energy spectrum is obtained by differentiating the integral spectra of pulses from a scintillator. This is done by using a least-squares method of determining the derivative,

L 22419-66
ACC NR: AP6007950

decreasing the fluctuations that result from differentiation of experimental amplitude distributions. The algorithm for finding the derivative of the empirical curve is simple, since it is based on approximating a section of the empirical curve by a second-order parabola. If the pulse-height distributions vary over the differentiation section by not more than a factor 2 -- 3, the obtained derivative will differ from the analytic value by not more than 1 -- 3%. The results are illustrated with spectra of reactor neutrons that have passed through different thicknesses of iron under good-geometry conditions. The unpublished article contains detailed characteristics of the spectrometer employed, its block diagram, the gamma-ray discrimination system, and also results of measurements of spectra of standard source and spectra of reactor neutrons passing through different thicknesses of beryllium. Orig. art. has: 1 figure.

SUB CODE: 18 SUBM DATE: 03Aug65/ ORIG REF: 002/ OTH REF: 001

Card 2/2

L 05057-67 EWT(m)/EWP(t)/ETI IJP(c) JD/HW/JR/GD
ACC NR: AT6027932 SOURCE CODE: UR/0000/66/000/000/0164/0169

AUTHOR: Abagyan, A. A.; Belov, S. P.; Kazanskiy, Yu. A.; Popov, V. I.; Fadeyev, I. A.; Dubinin, A. A.

ORG: None

TITLE: On the function of effectiveness of shielding materials with respect to capture gamma-radiation

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 164-169

TOPIC TAGS: radiation shielding, radiative capture, gamma radiation

ABSTRACT: The authors compare experimental and theoretical data on the function of effectiveness of shielding materials with respect to capture γ-radiation in nickel. The function of effectiveness is expressed as a linear combination of quantities of the type h_{Ap}

$$f(x) = h_{Ap} - \frac{\rho_B}{\rho_A} h_{Bp}$$

where ρ_A and ρ_B represent the concentrations of the respective components in the shield-

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L 05057-67
ACC NR: AT6027932

ing materials. This function shows the change which takes place in the functional $J_{n,\gamma}$ when a unit of substance B is substituted for a unit of substance A where

$$J_{n,\gamma} = \sum_i \beta_i k_i \iiint \frac{\Phi(r_s, \mu, E)}{4\pi r_s^2} \Sigma_{n,\gamma}(r_s, E) e^{-\int_{r_s}^{H} \mu^i(r) dr} B_i d\mu dE dV$$

describes the production and yield of capture γ-radiation. In this formula $\Phi(r_s, \mu, E)$ is neutron flux; $\Sigma_{n,\gamma}(r_s, E)$ is the macroscopic cross section of radiation neutron capture; β_i is the yield of γ-quanta of given energy E_i per captured neutron; k_i is the dose created by a unit flux of γ-quanta of energy E_i; $\mu^i(r)$ is the total coefficient of linear absorption of γ-quanta of initial energy E_i; B_i is the dose factor for accumulation of γ-quanta of initial energy E_i. The function $f(x)$ was experimentally studied by introducing a hydrogen-containing substance into a nickel screen made up of sheets measuring 80×80×0.8 cm for an overall thickness of 25 cm. This specimen was surrounded by a neutron shield for reducing the background. A single-crystal scintillation gamma-spectrometer with a crystal of sodium iodide was used for measuring the number of capture γ-quanta with an energy of greater than 7 Mev produced by radiation capture of neutrons in the nickel. Curves are given showing neutron hazard functions with respect to capture γ-radiation. These functions describe the contribution of neutrons to the stream of γ-quanta behind the screen as a function of the neutron energy and inlet coordinate. The results show that the addition of hydrogen-containing material through nearly the entire thickness of the nickel layer increases the inten-

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ACC NR: AT6027932

sity of capture γ-radiation behind the screen. An exception to this rule is the first 6 cm of nickel where the neutron hazard function for low energy particles is less than the function for high energy neutrons so that a good moderator placed at these points reduces the intensity of capture γ-quanta behind the screen. The authors thank V. V. Orlov, V. Ya. Pupko and S. G. Tsypin for interest in the work. Orig. art. has: 4 figures, 17 formulas.

SUB CODE: 18/ SUBM DATE: 12Jan66/ ORIG REF: 005

Card 3/3

L 05048-67 EWT(m) JR/GD

ACC NR: AT6027922 SOURCE CODE: UR/0000/66/000/000/0072/0073

39

AUTHOR: Dulin, V. A.; Kazanskiy, Yu. A.

37

ORG: None

B+1

TITLE: Angular distributions of fast neutrons in various environments

19

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 72-73

19

TOPIC TAGS: angular distribution, anisotropic medium, neutron energy distribution, fast neutron

ABSTRACT: The authors consider the angular energy distributions of fast neutrons under conditions of barrier geometry as a function of the atomic weight of the ambient medium, the thickness of the barrier and the energy and shape of the neutron source. For media which do not contain hydrogen, the angular distribution of the radiation within the solid angle $2\pi\sin\theta d\theta$ from an isotropic point source of neutrons with an energy of 3.4 Mev at angles of 20-70° is isotropic and practically independent of atomic weight and thickness of the medium (for a thickness of 1.5-5 times the mean free path) with an accuracy of 20-30%. As the energy of the neutron source is increased, the dosage in this solid angle begins to show angular anisotropy. Curves are given showing the angular distribution of fast neutrons with an energy above this threshold value. The results show that the angular distribution of fast neutron radiation for

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ACC NR: AT6027922

2

angles greater than 30° is independent of the form of the environment or its thickness and is not even affected by the energy and shape of the neutron source. The measurement error is less than 10%. It is possible that this conclusion will not be valid for a greater thickness and neutrons in the reactor spectrum. The authors thank S. G. Tsypin for useful consultation and V. G. Dvukhsherstnov for assistance in the work. Orig. art. has: 2 figures.

SUB CODE: 18 20,12/ SUBM DATE: 12Jan66/ ORIG REF: 003/ OTH REF: 001

Card 2/2 pla

L 05056-67 EWT(m) JR/GD

ACC NR: AT6027931 SOURCE CODE: UR/000/66/000/000/0156/0163

AUTHOR: Bakov, A. T.; Kazanskiy, Yu. A. 36

ORG: None B+1

TITLE: Gamma-quanta from radiation capture of resonance and fast neutron (a survey)

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding) sbornik statey, no. 2. Moscow, Atomizdat, 1966, 156-163

TOPIC TAGS: radiative capture, gamma radiation, fast neutron, radiation shielding

ABSTRACT: The authors review the literature published before January 1964 on the spectra of γ-quanta from radiation capture of fast neutrons. The causes for variations in these spectra and the available experimental data are summarized. Requirements are formulated for studying radiation capture γ-quanta from the standpoint of shielding design. All variations in γ-quanta spectra are greatest for the hard radiation region. Where the intensity of the transition to the ground state is high, fluctuations alter the remaining portion of the spectrum. Contrary to expectations the spectra of capture γ-quanta in almost all experiments are practically independent of neutron energy in the 30-500 kev range. The considerable differences between the spectra of capture γ-quanta on various resonances as well as the differences between these spectra and those resulting from capture of thermal neutrons make it necessary to mea-

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ACC NR: AT6027931

sure the averaged spectra of γ-quanta on several resonances. These measurements should be made with incident neutron spectra of the form $1/E_n$ and with rather thick specimens for averaging with respect to neutron spectra which are close to those established in the material being studied. Much of the literature on the spectra of γ-quanta from capture of nonthermal neutrons has no practical application for comparison of the necessary group spectra of capture γ-quanta since the measurements are qualitative (do not indicate the number of γ-quanta per capture). A table is given summarizing the experimental data on the absolute yield of γ-quanta from radiation capture of neutrons with various energies. Orig. art. has: 1 figure, 1 table, 6 formulas.

SUB CODE: 18/ SUBM DATE: 12Jan66/ ORIG REF: 012/ OTH REF: 023

Card 2/2

L 05069-67 EWT(m) JR/GD

ACC NR: AT6027933 SOURCE CODE: UR/0000/66/000/000/0170/0174

39

AUTHOR: Abagyan, A. A.; Belov, S. P.; Kazanskiy, Yu. A.; Mazin, V. I. 37

ORG: None

B+1

TITLE: Measurement and calculation of the coefficients of secondary gamma-radiation 19

SOURCE: Voprosy fiziki zashchity reaktorov (Problems in physics of reactor shielding); sbornik statey, no. 2. Moscow, Atomizdat, 1966, 170-174

19

TOPIC TAGS: gamma radiation, neutron, radiation shielding, capture cross section

ABSTRACT: The authors consider the coefficient of secondary emission β which expresses the ratio of the total number, dose or energy of capture γ-quanta to the total number of neutrons emitted from a given shielding material. The general expression for this coefficient is

$$\beta = \frac{\sum_i \int \Phi(r, \Omega, E) \Sigma_{n,\gamma}(E) \eta_i(E) \psi(r, r_s, E_i) d\Omega dE dV ds}{\int \Phi(r_s, \Omega, E) d\Omega dE ds},$$

where $\Phi(r, \Omega, E)$ is the neutron flux at the point r in the unit energy interval at energy E and in the unit solid angle about the direction Ω; $\Sigma_{n,\gamma}(E)$ is the radiation capture cross section for neutrons of energy E; $\eta_i(E)$ is the yield of γ-quanta of

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ACC NR: AT6027933

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energy E_i per capture of a single neutron with energy E; $\psi(r, r_s, E_i)$ is the function which gives the attenuation of the stream of γ-quanta with energy E_i from the point of γ-quantum production r to the points r_s on the surface. A formula is derived for the asymptotic value of β determined by the physical properties of the shielding material alone. A comparison of theoretical and experimental asymptotic values of β shows a systematic divergence by a factor of approximately 2.5, the theoretical data being overestimated. The reason for the divergence is assumed to be inaccurate determination of neutron intensities at the boundary. In spite of the discrepancy between experimental and theoretical data, the nearly constant divergence obtained for various elements with large, small and moderate capture cross sections (tungsten, lead, iron and nickel) indicates that the proposed method may be used for calculating the asymptotic values of β with an accuracy of 30% if a correction factor of 2.6 is used. The authors thank S. G. Tsypin and V. Ya. Pupko for interest in the work and useful remarks. Orig. art. has: 3 figures, 6 formulas.

SUB CODE: 18/ SUBM DATE: 12Jan66/ ORIG REF: 003

Card 2/2 *pla*

L 06979-67 EWT(m) JR
ACC NR: AP6018354 (N) SOURCE CODE: UR/0089/66/020/005/0424/0424

AUTHOR: Kazanskiy, Yu. A.; Kukhtevich, V. I.; Popov, V. I.; Tarasov, V. V.; Shemetenko, B. P.

41
B

ORG: none

TITLE: Dependence of the buildup factor on the location of the detector behind the shield

SOURCE: Atomnaya energiya, v. 20, no. 5, 1966, 424

TOPIC TAGS: reactor shielding, gamma scattering, gamma detection, scintillation detector

ABSTRACT: This is an abstract of article No. 76/3559, submitted to the editor and filed, but not published in full. Inasmuch as earlier investigations of the build-up factors, with the aid of which account is taken of the scattered gamma radiation, were made for observation points situated either inside or on the surface of the shield, the authors measured the accumulation factors with a radioactive source of gamma radiation (Cs^{137}) at different positions of the detector and the source behind an aluminum barrier of thickness equal to 2.8 mean free paths and of diameter

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ACC NR: AP6018354

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40 cm. The measurements were made with a scintillation detector (stilbene crystal). The distance from the source to the shield surface facing the detector ranged from 18 to 150 cm. For each value of this distance, the distance from the surface of the shield to the detector was varied from 0 to 500 cm. The results show that the decrease of the accumulation factor with increasing distance R has the form $(1/\sin\theta)\exp(-k_T\theta)$ for a point-like isotropic source on the surface of the shield, and the form $\exp(-k_p\theta)$ for a plane parallel beam. The test results were compared with values calculated in accordance with a semiempirical procedure described by the authors earlier (Byulleten' Informatsionnogo tsentra po yadernym dannym [Bull. of Information Center on Nuclear Data] no. 2, Atomizdat, 1965, p. 305. Orig. art. has: 1 figure.

SUB CODE: 18 SUBM DATE: 30Dec65/ ORIG REF: 002 OTH REF: 002

Card 2/2 Pek

L 07993-67 EWT(m)/EWP(t)/ETI JD
ACC NR: AP7001665 SOURCE CODE: UR/0094/66/000/008/0016/0018

AUTHOR: Kazantsev, Yu. A. (Engineer; Orgpishcheprom)

ORG: none

24
B

TITLE: Ultrasonics to prevent boiler scale

SOURCE: Promyshlennaya energetika, no. 8, 1966, 16-18

TOPIC TAGS: ultrasonics, steam boiler

ABSTRACT: The article reports on the experimental use of ultrasonic apparatus to prevent accumulation of boiler scale. Successful results have been obtained so far with small-capacity boilers (steam rate up to 2.5 tons/hour) of the VGD, MMZ, Shukhov, DKVR, Lancashire and locomobile types; further work is being done with larger-capacity boilers (up to 6 tons/hour). Ultrasonic pulses are generated by a device consisting of a capacitor, a thyratron and a magnetostrictive transducer set. The capacitor is energized from the power line through a rectifier-usually a 6N8S twin triode with separate cathodes. The capacitor discharges through a thyratron, usually a hydrogen-filled TGI1-400/3,5 type which operates over a wide range of frequencies and power, producing 10-20 A pulses of 10-15 microsec duration. Various methods of triggering were tried out and the blocking-oscillator scheme was found most promising of all. The magnetostrictive transducers in the form of nickel plates 0.03 mm thick and 25x25 mm area are welded to 3/4-wavelength conduits

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ACC NR: AP7001665

which carry the ultrasonic pulses to the boiler drum at a few selected locations; there the conduits are welded to the drum wall. Ultrasonic pulses thus produced and carried into the operating zone can be effective in a steam generator where the water hardness is up to 8 ppm. Further development work is required to perfect this method of preventing boiler scale; much benefit can be derived from the practical experience gained in the Krasnodar District of the RSSR. Orig. art. has: 2 figures. [JPRS: 37,811]

SUB CODE: 20, 13 / SUBM DATE: none

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APPROVED FOR RELEASE: 06/13/2000 CIA-RDP86-00513R000721320010-5"

NIKOLAYEV, V.P.; ZHIL'TSOV, A.A.; KAZANSKIY, Yu.A.

Polar radiance meter. Trudy Inst. okean. 74:55-61 '65.
(MIRA 18:12)

L 09096-67
ACC NR: AT7002338 SOURCE CODE: UR/2944/66/000/003/0105/0112

13

AUTHOR: Kazarinov, Yu. F.

ORG: none

TITLE: Maximum principle for the problem of the miximization of an integral functional with variable lag

SOURCE: Leningrad. Universitet. Kafedra Vychislitel'noy matematiki i vychislitel'n tsentr. Metody vychisleniy, no. 3, 1966, 105-112

TOPIC TAGS: ordinary differential equation, differential equation system

ABSTRACT: Manufacturing processes involved in the working of various products are often described by a system of ordinary differential equations containing control parameters, while production output is described by the value of a certain integral functional dependent on the retarded argument $\tau(t)$, which is given by the functional relation connecting the phase coordinates of the system at moments t and $\tau(t)$. The determination of the process conditions which assure maximum output involves the problem of the maximization of the functional

$$I = \int_{t_0}^{t_1} f_0(x(t), x(\tau), u(t))\,dt,$$

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ACC NR: AT7002338

$x(t) = (x_1(t), \ldots, x_n(t))$ is a vector function satisfying the system of differential equations

$$\dot{x}_\alpha(t) = f_\alpha(x(t), u(t)) \quad (\alpha = 1, 2, \ldots, n)$$

with the boundary conditions

$$x(t_0) \in \Gamma_0, \; x(t_1) \in \Gamma_1.$$

Here $u(t) = (u, \ldots, u)$ is the control vector which must be chosen, while $\tau(t)$ is determined from the condition

$$\varphi(x(t), x(\tau)) = 0.$$

The case in which the lag $\theta = t - \tau$ is constant was considered by L. S. PONTRYAGIN, V. G. BOLTYANSKIY, R. V. GAMKRELIDZE, and Ye. F. MISHCHENKO in their book Matematicheskaya teoriya optimal'nykh protsessov (Mathematical Theory of Optimal Processes). The purpose of the present article is to extend L. S. PONTRYAGIN's maximum principle to the case formulated supra. Orig. art. has: 20 formulas. [JPRS: 38,163]

SUB CODE: 12 / SUBM DATE: 10Dec62

Card 2/2 nst

KAZANSKIY, YU. N.

KAZANSKIY, YU. N. -- "Obtaining High Electrical Conductivity Plastics on a Phenol-Formaldehyde Resin Base." Sub 6 Mar 52, Moscow Aviation Technological Inst (Dissertation for the Degree of Candidate in Technical Sciences)

SO: Vechernaya Moskva, January-December 1952

Kazanskiy, Yu. N. PHASE I BOOK EXPLOITATION 680

Gol'dberg, Mikhail Markovich, Zakharov, Vasiliy Aleksandrovich, Kazanskiy, Yuriy Nikolayevich, Leont'yeva, Valentina Petrovna, Losev, Ivan Platonovich, Trostyanskaya, Yelena Borisovna, Khazanov, Grigoriy Mikhaylovich, Chebotarevskiy, Vladimir Vladimimirovich, and Sheydeman, Igor' Yur'yevich

Nemetallicheskiye materialy i ikh primeneniye v aviastroyenii (Nonmetallic Materials and Their Use in Aircraft Construction) Moscow, Oborongiz, 1958. 428 p. 15,000 copies printed.

Eds.: Losev, I.P. and Trostyanskaya, Ye. B.; Reviewere: Bondarev, V.S., Engineer; Scientific Ed.: Panshin, B.I., Candidate of Technical Sciences; Ed. of Publishing House: Tubyanskaya, F.G.; Tech. Ed.: Rozhin, V.P.; Managing Ed.: Sokolov, A.I., Engineer.

PURPOSE: This is a textbook for students at advanced aeronautical engineering schools and may also be useful for engineers and technicians in industry and at scientific-research institutes who are interested in nonmetallic materials.

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COVERAGE: The book describes the characteristics and properties of nonmetallic materials and the technology used in their production and also the shop processes by which they are fabricated into structural members, assemblies, and aggregates. The information given in the book covers the entire range of nonmetallic materials used in aircraft construction, namely: plastics, rubber, paper, wood and textiles, glue, lacquer, paints, and coatings. The authors made use of the results of a pedagogic experiment of many years standing, i.e., the lecture course "Technology of Nonmetallic Materials" given at MATI (Moscow Aviation Technology Institute) and MAI (Moscow Aviation Institute). The book was compiled by workers in the department "Technology of Treatment of Nonmetallic Materials" at the MATI and of the department "Engineering Materials" at MAI under the general direction of the editors, I.P. Losev, Professor, Doctor of Chemical Sciences, and Ye. B. Trostyanskaya, Professor, Doctor of Technical Sciences. The authors of the first and second chapters are Ye. B. Trostyanskaya and I.P. Losev; of the third chapter, Ye. B. Trostyanskaya and G.M. Khazanov; of the fourth chapter, V.P. Leont'yeva; of the fifth chapter, V.A. Zakharov; of the sixth and seventh chapters, Yu. N. Kazanskiy; of the eigth chapter, I.Yu. Sheydeman; of the ninth chapter, Ye. B. Trostyanskaya, and those of the tenth chapter, M.M. Gol'dberg and V.V. Chebotarevskiy. The section of the seventh chapter "Mechanizing production methods used in molding objects from plastics" was written by G.I. Shapiro, and the section of the ninth chapter "Mechanical reinforcement of articles made of nonmetallic materials" by V.P. Leont'yeva; the author of paragraph 5 in that section was I.Yu. Sheydeman. The authors thank Ya. D. Avrasin, V.S. Bondarev, and M. Ya. Sharov for valuable advice and B.I. Panshin, Candidate of Technical Sciences, for his assistance in readying the manuscript for publication. The book contains 180 figures and 30 tables. There are 50 references, of which 48 are Soviet and 2 English.

Nonmetallic Materials and Their Use (Cont.) 680

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Ch. III. Rubber Materials

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KAZANSKIY, Yu.N.

5(3); 25(2) PHASE I BOOK EXPLOITATION SOV/2884

Moscow. Dom nauchno-tekhnicheskoy propagandy imeni F.E. Dzerzhinskogo

Plastmassy v mashinostroyenii (Plastics in Machine Building) Moscow, Mashgiz, 1959. 236 p. Errata slip inserted. 8,000 copies printed.

Sponsoring Agency: Obshchestvo po rasprostraneniyu politicheskikh i nauchnykh znaniy RSFSR.

Ed. (Title page): V.K. Zavgorodniy; Ed. (Inside book): B.M. Rotkin, Engineer; Ed. of Publishing House: O.M. Konovalov; Tech. Ed.: A. F. Uvarova; Managing Ed. for Literature on Machine Building and Instrument Making (Mashgiz): N.V. Pokrovskiy, Engineer.

PURPOSE: This collection of articles is intended for engineers and technicians in the machine-building industry.

COVERAGE: This collection reviews the progress made by the Soviet Union in the field of manufacturing new plastic materials and fabricating different plastic-material articles for use in the machine-building industry. Physicomechanical and dielectric properties of phenolite, decorrosite, fluoroplastics, epoxy resins, polyamides, laminated plastics, and fiberglass plastics are analyzed and their use in machine building described. Characteristics and composition of adhesives and bonding agents are given and the technology of the pressing process described. Methods of coating with plastics as a protection against corrosion are explained, and metallization of plastics achieved by vacuum evaporation is reviewed, as well as equipment used for manufacturing and fabricating plastics and articles made of plastics. Mechanization of certain operations and automatic control of various processes are discussed. No personalities are mentioned. References accompany individual articles.

AVAILABLE: Library of Congress

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Z/011/61/018/001/007/014
E112/E453

AUTHORS: Gol'dberg, M.M. and Kazanskiy, Yu.N.

TITLE: Determination of absolute viscosity of alkyd resins (for paints)

PERIODICAL: Chemie a chemická technologie, 1961, Vol.18, No.1, p.31, abstract CH 61-430 (Lakokras. Materialy, 1960, No.1, pp.68-71)

TEXT: To follow the course of esterification, a special viscometer with an elastic thread is recommended. It offers the advantage that its sensitivity can be changed over a wide range by using threads of varying diameter and length. It permits to measure the absolute viscosity over a temperature range of 80 to 250°C. The viscosity graphs of some alkyd resins are shown. Cross-section and photograph of apparatus, 6 diagrams.

[Abstractor's note: Complete translation.]

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KAZANSKIY, Yu.N.

Viscosimeter for determining viscosity in the production of alkyd resins. Lakokras.mat. i ikh prim. no.2:55-61 '61. (MIRA 14:4)

1. Moskovskiy aviatsionnyy tekhnologicheskiy institut.
(Alkyd resins) (Viscosimeter)

GOL'DBERG, M.M.; KAZANSKIY, Yu.N.

Investigation of the absolute viscosity of lacquer alkyd bases.
Lakokras.mat. i ikh prim. no.1:68-71 '60. (MIRA 14:4)

1. Moskovskiy aviatsionnyy tekhnologicheskiy institut.
(Alkyd resins)

S/081/62/000/007/028/033
B168/B101

AUTHORS: Kagan, D. F., Kazanskiy, Yu. N., Nemlikher, M. Ya.

TITLE: Metal coating of plastics by the method of evaporating in a high vacuum

PERIODICAL: Referativnyy zhurnal. Khimiya, no. 7, 1962, 623, abstract 4P81 (Sb. "Plastmassy v mashinostr.". M., Mashgiz, 1959, 136-143)

TEXT: Methods of coating plastics with metal are detailed and the principal features of the method of evaporating metals in a vacuum are outlined. The adhesion of a metal coating to the surface of organic glass is examined and a method of determining the quality and thickness of the metal layer is set forth; the apparatus for the metal-plating of plastics is described and the electrical conductivity of the layer is given. [Abstracter's note: Complete translation.]

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38716

S/191/62/000/007/003/011
B124/B144

15 810

AUTHORS: Trostyanskaya, Ye. B., Vinogradov, V. M., Kazanskiy, Yu. N.

TITLE: Molding materials based on thermosetting polyesters. Communication I. Polyester molding materials with powdery fillers

PERIODICAL: Plasticheskiye massy, no. 7, 1962, 15-19

TEXT: The applicability of the Soviet unsaturated polyesters ПН-1 (PN-1), ТМГФ-11 (TMGF-11), and ТПАС (TPAS) (thermostable polyacrylate binder) as binders for molding materials is investigated. The polyesters were cured in cylindrical molds in the presence of 1% benzoyl peroxide at 120°C in amounts of 12 g each, and were kept at 150°C for 5 hr. The volume shrinkage was determined from the change in density of the polyester after curing. Quartz powder, talc, mica, and kaolin were used as fillers and mixed with the binder. Benzoyl peroxide was added in a mixture with styrene, diallyl phthalate, dibutyl phthalate, or polyacrylate. Molding materials based on PN-1, TMGF-11, and TPAS are moldable for 4 hr, 8 hr, and 1.5 months, respectively, this period depending also

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on the shape and size of the block. If a surface-active substance is added instead of part of the filler, the storage stability of the molding material increases, whilst addition of a thickener confers thixotropic properties. The following formula was generally applied (parts by weight): 100 polyester, 1 initiator, 84 mineral filler, and 66 thickener. Before molding, the molding powder must be treated by rolling to remove the air. The fluidity of pastes got from various polyesters with 60-70% filler varies between 50 and 80 mm at a molding pressure of 90 kg/cm^2 and a mold temperature of 120°C. The rate of polymerization of the polyacrylate and the ratio polyacrylate:polymaleinate exert a decisive effect on the physicochemical properties of the cured materials. The curing of polymaleinates with polyacrylates of moderate polymerization rate is analogous to the process of curing with polystyrene. The best results were obtained with the use of TPAS + PN-1. A pressure of 50-200 kg/cm^2, a temperature of 120°C, and a curing time of 1 min/mm were adopted for powdery molding materials. Table 6 shows the properties of the products obtained. Cold extrusion can be used for treating the molding material pastes. Thanks are expressed to P. Z. Li and Ya. D. Avrasin. There are 2 figures and